Simpson Road Sediment Model: a Tool for Informing Operational Decisions

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Simpson Resource Co. is pursuing the development of an empirically driven GIS based road sediment model. The purpose of the model is to quantify the amount of sediment derived from our roads to the channel network and assist our logging managers in making decisions about wet weather haul, road maintenance and remediation activities, and timber harvest unit scheduling. Building blocks of the model are: area specific rainfall records, road response class excess runoff relationships, ownership wide road inventories, sediment rating curves for varying levels and types of traffic, timber harvest plans, customer based log haul routes and Simpson's total maximum daily load allocation (TMDL) for sediment. Progress on model components to date includes the establishment of rainfall databases, development of unit hydrographs, collection of road inventory data, collection and processing of sediment samples, determination of traffic patterns and travel rates, and scoping of the user interface and GIS components. Excess runoff relationships have been described using road infiltration capacities and instantaneous unit hydrographs. While each road segment responds differently to precipitation and winter soil moisture, excess runoff relationships can be generalized to our road inventory and describe patterns of excess runoff sufficiently for model purposes. For the same road segment, sediment concentrations in runoff water differ more than an order of magnitude between heavy haul periods and periods of temporary non-use. Road surfaces flush of fines within several hours of cessation of heavy haul. Integration of all model components into the GIS and development of the user interface is anticipated during 2004.

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